

This listing of the claims will replace all prior versions, and listings, of claims in the present application:

LISTING OF THE CLAIMS:

Claim 1 (Currently Amended) A method for forming a semiconductor structure comprising the steps of:

providing a structure having at least one wire bond pad in contact with a metal line of an interconnect structure, said at least one wire bond pad having an exposed surface portion;

forming a metallic cap on at least the exposed upper surface portion of the wire bond pad, said metallic cap comprises a TiN seed layer with an an ~~[[Ti or]]~~ Al layer atop and is resistant to alkaline attack; ~~[[and]]~~

performing a clean/pretreatment step on said Al layer; and

forming Ni/Au metallization on said metallic cap, wherein said ~~[[the]]~~ Ni/Au metallization comprises a Ni layer overlaid by an Au layer, wherein said ~~[[the]]~~ Ni layer is formed by electroless deposition of Ni, and ~~wherein~~ said ~~[[the]]~~ Au layer is formed by immersion deposition of Au followed by electroless deposition of Au.

Claim 2 (Original) The method of Claim 1 wherein the metallic cap is formed on the exposed surface portion of the wire bond pad through an opening formed in an overlaying passivation stack.

Claim 3 (Original) The method of Claim 1 wherein the metallic cap is formed atop an entire surface of a metal layer and then the metallic cap and metal layer are selectively etched to form the metallic cap on at least the exposed upper surface portion of the wire bond pad.

Claim 4 (Cancelled)

Claim 5 (Original) The method of Claim 1 wherein said structure further includes a barrier and a lower passivation layer formed atop the interconnect structure.

Claim 6 (Original) The method of Claim 1 wherein the wire bond pad is comprised of Al or an aluminum alloy.

Claim 7 (Cancelled).

Claim 8 (Currently Amended) The method of Claim 1 wherein the TiN seed layer of the metallic cap has a thickness of about 500 Å or less, and wherein the [[Ti or]] Al layer of the metallic cap has a thickness less than about 10000 Å.

Claims 9 - 20 (Cancelled)

Claim 21 (Previously Presented) The method of Claim 1 further comprising bonding a wire to said Ni/Au metallization.

Claim 22 (Cancelled)

Claim 23 (New) The method of Claim 1 wherein said clean/pretreatment step removes surfaces of said Al layer and protects said surfaces against future oxidation.

Claim 24 (New) The method of Claim 1 wherein said clean/pretreatment step comprises:

performing an acid etch and micro-etching a surface of said Al layer for improved adhesion;

treating said surface of said Al layer with a first solution of zincate containing ZnO and NaOH as major components;

immersing said surface of said Al layer in dilute HNO₃; and

treating said surface of said Al layer with a second solution of zincate containing ZnO and NaOH as major components.

Claim 25 (New) The method of Claim 24 further comprising rinsing said surface of said Al layer with water after performing said acid etch and prior to said treating said surface with said first solution.

Claim 26 (New) The method of Claim 25 further comprising forming a thin continuous and uniform film of Zn on said surface of said Al layer, wherein a thickness of said film of Zn is on the order of about 100 nm.

Claim 27 (New) A method for forming a semiconductor structure comprising the steps of:

providing a structure having at least one wire bond pad in contact with a metal line of an interconnect structure, said at least one wire bond pad having an exposed surface portion;

forming a metallic cap on at least the exposed upper surface portion of the wire bond pad, said metallic cap comprises a TiN seed layer with a Ti layer atop and is resistant to alkaline attack;

performing a clean/pretreatment step on said Ti layer; and

forming Ni/Au metallization on said metallic cap, wherein said Ni/Au metallization comprises a Ni layer overlaid by an Au layer, said Ni layer is formed by electroless deposition of Ni, and said Au layer is formed by immersion deposition of Au followed by electroless deposition of Au.

Claim 28 (New) The method of Claim 27 wherein the metallic cap is formed on the exposed surface portion of the wire bond pad through an opening formed in an overlaying passivation stack.

Claim 29 (New) The method of Claim 27 wherein the metallic cap is formed atop an entire surface of a metal layer and then the metallic cap and metal layer are selectively etched to form the metallic cap on at least the exposed upper surface portion of the wire bond pad.

Claim 30 (New) The method of Claim 27 wherein said structure further includes a barrier and a lower passivation layer formed atop the interconnect structure.

Claim 31 (New) The method of Claim 27 wherein the wire bond pad is comprised of Al or an aluminum alloy.

Claim 32 (New) The method of Claim 27 wherein the TiN seed layer of the metallic cap has a thickness of about 500 Å or less, and wherein the Ti layer of the metallic cap has a thickness less than about 10000 Å.

Claim 33 (New) The method of Claim 27 further comprising bonding a wire to said Ni/Au metallization.

Claim 34 (New) The method of Claim 27 wherein a surface of said Ti layer is activated by said clean/pretreatment.

Claim 35 (New) The method of Claim 27 further comprising:

treating a surface of said Ti layer with an alkali type cleaner with a pH in the range from 7 – 12;

treating said surface of said Ti layer with a KCN type cleaner;

performing an HCl acid etching on said surface of said Ti layer; and

treating said surface of said Ti layer with a fluorine based Pd activator.